



# TECHNICAL NOTE

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## INTERIM GUIDE FOR RATING SOILS ACCORDING TO THEIR SOIL SUITABILITY FOR RANGELAND SEEDING - NEVADA

James S. Hagiwara, Carl M. Rice, Lucien N. Langan \*\*\*

### Foreword

The interim soil suitability guide is applicable primarily to northern Nevada, southeastern Oregon and the extreme part of southwestern Idaho. It can be easily adapted for use in other areas by changing the criteria under the classes to fit the local situation.

It is anticipated this guide will provide a format for future development of soil suitability guides and interpretations for other mechanical land treatment practices. The guide also shows how soil inventory data is used to make soil suitability interpretations for one kind of land treatment practice.

### Soil Suitability Guide

Successful seedings on depleted rangelands of Nevada will result in decreased runoff and subsequent decrease in soil losses from erosion. The former will result in increased amounts of water available to plants for growth and maintenance of plant vigor, while the latter will result in substantial reductions in sediment yield.

The soil suitability rating is intended to be a relative rating suggestive proportion of successful seeding establishments that might be expected during a given period of years. In addition, the number of plant species adapted to the soil and its properties decrease with decreasing soil suitability. For example, successful seedings can be expected in 7 or more years out of 10 for a soil that is rated "good," and any one of several different plants may be successfully seeded. Successful seedings will result in about 5 years out of 10 for a soil that is rated "poor," and only the most drought tolerant plants can be seeded. A soil rated "very poor" should be considered for seeding only under emergency circumstances, such as after a fire to keep soil erosion losses to a minimum, because seeding success may only be as high as 3 years out of 10, but normally is even less successful.

\*\*\* Soil Scientist, BLM  
Natural Resource Specialist, BLM  
Soil Scientist, SCS, respectively

BLM Library  
D-553A, Building 50  
Denver Federal Center  
P. O. Box 25047  
Denver, CO 80225-0047



INTERIM  
SOIL SUTABILITY CLASSES FOR RANGELAND SEEDING - NEVADA

	<u>Good</u>	<u>Fair</u>	<u>Poor</u>	<u>Very Poor</u>
<u>Precipitation</u>				
Thermic soils (MAST > 59.6°F)	>16" <u>1/</u>	14-16" <u>1/</u>	12-14" <u>1/ 2/</u>	<12" <u>2/</u>
Mesic and Frigid Soils (MAST < 59.6°F)	>12" <u>1/</u>	10-12" <u>1/</u>	8-10" <u>1/ 2/</u>	<8" <u>2/</u>
<u>Surface Texture</u>	cosl, sl, fsl, c, sic vfsl, l, sil, sicl, cl, scl <u>3/</u>		lfs, ls <u>4/</u>	all sands, lcos
<u>Coarse Fragments</u> <u>5/</u>				
Gravel & Cobbles	<15% (vol.)	15-50% (vol.)	15-50% (vol.)	>50% (vol.)
Stones	<2% (vol.)	2-10% (vol.)	10-25% (vol.)	>25% (vol.)
<u>Root Zone</u> <u>6/</u>	>40"	20-40" <u>7/</u>	20-40" <u>7/</u>	<20" <u>8/</u>
<u>Depth to sand and/or gravel</u>	>40"	20-40"	10-20" <u>9/</u>	<10"
<u>Abrupt Textural Boundary A-B</u>	>20"	10-20"	4-10"	<4"
<u>Avail. Water Cap.</u> <u>10/</u>				
Surface 7"	>1.0"	0.8-1.0"	0.6-0.8"	<0.6"
Usable Profile	>5.0"	3.5-5.0"	2.5-3.5"	<2.5"
<u>ESP (Surface 7")</u>	< 5% <u>11/</u>	< 5% <u>11/</u>	5-15% <u>12/</u>	>15%
<u>ECX10<sup>3</sup> at 25°C.</u> (Surface 7")	< 4 <u>13/ 14/</u>	< 4 <u>13/ 14/</u>	< 4 <u>14/</u>	>4
<u>Slope</u>	0-15%	15-30%	15-30%	>30% <u>15/</u>
<u>Rock Outcrops</u> (Surface Area)	< 2%	2-10%	10-25%	>25%



Also considered in rating a soil for rangeland seeding are machinery limitations that may result from soil properties, such as the presence of stones, rock outcrops, and excessive slope.

It is not the intent of the suitability rating to be a measure of the total annual yield, though in some instances it may be so. Productivity is dependent upon the interaction of almost all of the soil properties and qualities that are considered.

The soil will be rated fair, poor or very poor by its most limiting property as listed in the attached guide, even if only one such property exists. It must be pointed out that the criteria included in the guide are not independent variables that can be applied directly to all soil properties and qualities as they occur in the landscape. Interactions among soil properties listed in the guide may be great enough to require a change in some of the soil suitability ratings. Several interactions, identified by footnote, have an overriding property or quality that render the soil more or less suitable than would be expected unless they were taken into account. The guides provide for rating different kinds of soil into four degrees of suitability; namely, Good, Fair, Poor, and Very Poor. Kinds of soil having the same soil name and occurring in the same defined SCS Major Land Resource Area (MLRA) should have the same rating.

Descriptions of mapping units consisting of phases of soil series, families, or subgroups include the soil properties and qualities used as criteria in rating a soil's suitability for rangeland seeding. These are available in Soil Survey manuscripts of handbooks for areas being mapped. The properties and qualities can also be obtained by field examination by Soil Scientists in areas where the aforementioned documents are not available.

#### Footnotes

1. Decrease one class if surface runoff is rapid or very rapid and erosion hazard is high or very high. (Must be evaluated on site.)
2. Increase one class if subject to periodic overflow or aspect is north and surface runoff is very slow, slow or medium. (Must be evaluated on site.)
3. Surface texture with moderate or strong vesicular crusts (a slightly hard or harder surface horizon at least 1" thick with common or many, medium or coarse vesicular pores) rate as follows: fair when soil is in  $>16$ " precipitation zone (thermic soils) and  $>12$ " precipitation (mesic and frigid soils); poor when soil is in 14-16" and 10-12" precipitation zones respectively; and very poor when soil is in 12-14" and 8-10" precipitation zones and seeding is planned to be done by means other than deep furrow drill.
4. Rate soils as very poor if in precipitation zones of  $\leq 12$ ", or for soils subject to severe wind erosion hazard (bare soils) in all precipitation zones.



5. Coarse fragment volume estimates are based on resultant volume after mixing the surface 7 inches.
6. Root zone is the depth of soil that is penetrated or can be penetrated by plant roots. In this context the only root limiting layers are bedrock, both "hard" and "soft," and hardpans.
7. Use available water capacity criteria for the specific suitability rating if effective rooting depth is 20 to 40 inches.
8. Rate soil poor if the available water capacity is  $>2.5$ ", precipitation is  $>10$ ", and slope is  $<30\%$ .
9. If the soil materials above the sand and/or gravel contain  $>15$  percent gravel or cobbles or  $>2$  percent stones, rate the soil very poor.
10. Available water capacity (AWC) criteria is given for two independent factors: surface 7" and effective rooting depth. The former is computed on a weighted average basis as though the surface 7 inches were mixed, while the latter is computed for the soil profile, on a weighted average basis, to a depth of 5 feet, or to bedrock or hardpan whichever is shallower.
11. Rate soil as poor if exchangeable sodium percentage (ESP) is  $>15\%$  within 10 inches.
12. Rate soil as very poor if exchangeable sodium percentage is  $>15$  within 10 inches.
13. Rate soil as poor if electrical conductivity ( $EC \times 10^3$  at  $25^\circ C$ ) is 4 to 8 within 20 inches.
14. Rate soil as very poor if  $EC \times 10^3$  at  $25^\circ C$  is  $>8$  within 20 inches.
15. Suitability rating is given under normal conditions. For mechanical seeding under emergency conditions, such as after fire to minimize excessive erosion losses, slopes up to 45 percent should be included and rated poor. Where  $>10$  percent stones are present on these slopes, the soil should be rated as very poor.